

## REMARKS

In the Office Action, the Examiner objected to the drawings for failing to show every feature of the invention specified in the claims. The Examiner also stated that Figures 1 and 2 has to be designated as prior art. The Examiner also objected to the Abstract. The Examiner also  
5 objected to the specification for certain informalities. The Examiner also provisionally rejected claims 1, 4, 16, and 19 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 2, 5, 6, 8, 9, 12, and 13 of copending Application No. 10/716,316. The Examiner also rejected claims 2-4 and 6-13 under 35 U.S.C. §112 second paragraph, as being indefinite. The Examiner also rejected claims 16-28 under 35 U.S.C. §101 as being  
10 directed to non-statutory subject matter. The Examiner also rejected claims 1-28 under 35 U.S.C. §101 for lacking patentable utility. The Examiner also rejected claims 1-10 and 14-25 under 35 U.S.C. §102 (b) as being anticipated by U.S. Patent No. 6,160,846 to Chiang et al. ("Chiang"). The Examiner also rejected claims 12-13, and 27-28 under 35 U.S.C. §103(a) as being unpatentable over Chiang. The Examiner also rejected claims 11 and 26 under 35 U.S.C. §103(a)  
15 as being unpatentable over Chiang in view of U.S. Patent No. 7,079,581 to Noh et al. ("Noh").

In this Amendment, Applicants have amended claims 1-14, 16-17, 20, and 28. Applicants have also added claims 29-36. Applicants have not canceled any claims. Accordingly, claims 1-36 will be pending after entry of this Amendment.

### **I. Objections to Drawings**

20 In the Office Action, the Examiner objected to the drawings for failing to show every feature of the invention specified in the claims. In this Amendment, Applicants have included three new drawing sheets to show the features of the claimed invention. applicants submit that no new matter is entered.

In the Office Action, the Examiner also stated that Figures 1 and 2 has to be designated as



prior art. Applicants respectfully traverse the Examiner's objections to Figure 1 and 2. Specifically, Applicants submit that although the system of Figure 1 is known in the art, it illustrates a system where some embodiments of the invention are implemented on. Also, Figure 2 illustrates how a rectangular video frame is divided into a matrix of macroblocks in some embodiments of the invention. In view of the foregoing, Applicants have not designated Figures 1 and 2 as Prior Art. Accordingly, Applicants respectfully request reconsideration and withdrawal of the objections to Figures 1 and 2.

## **II. Objections to the Abstract**

In the Office Action, the Examiner objected to the abstract for exceeding 150 words in length. In this Amendment, Applicants have amended the Abstract to contain less than 150 words. Accordingly, Applicants respectfully request reconsideration and withdrawal of the objections to the Abstract.

## **III. Objections to the Specification**

In the Office Action, the Examiner objected to the disclosure for certain informalities. In this Amendment, Applicants have amended the Specification to correct the informalities. Applicants have also amended the specification to include the description of the new drawing sheets. Applicants respectfully submit that the changes do not add any new matter. Applicants respectfully request that the Examiner approve the amendments.

## **IV. Double Patenting Claim Rejections**

In the Office Action, the Examiner also provisionally rejected claims 1, 4, 16, and 19 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 2, 5, 6, 8, 9, 12, and 13 of copending Application No. 10/716,316. Applicants respectfully request the double patenting rejections be placed in abeyance until the claims are allowed.

## **V. Rejection of claims 2-4 and 6-13 under 35 U.S.C. §112**



In the Office Action, the Examiner rejected claims 2-4 and 6-13 under §112 for reciting a limitation without sufficient antecedent basis. In this Amendment, Applicants have amended claims 2-4 and 6-13 to recite “method of quantizing” instead of “method of scaling”. Accordingly, Applicants respectfully request reconsideration and withdrawal of §112 rejection of claims 2-4 and 6-13.

#### **VI. Rejection of claims 1-28 under 35 U.S.C. §101**

In the Office Action, the Examiner rejected claims 16-28 under §101 for being directed to non-statutory subject matter. Specifically, the Examiner stated the word “comprising” is not considered sufficient enough for linking a computer program with a computer-readable medium in statutory form.

In this Amendment, Applicants have amended preambles of claims 16, 20, and 28. For instance, the preamble of claim 16 is amended to recite: “[a] computer readable medium storing a computer program executable by at least one processor, the computer program comprising sets of instructions for:” Similar amendments are made to claims 20 and 28 preambles. Accordingly, Applicants respectfully request reconsideration and withdrawal of §101 rejections of claims 16-28 for being directed to non-statutory subject matter.

In the Office Action, the Examiner also rejected claim 1-28 under §101 for lacking patentable utility. Specifically, the Examiner stated that, although the specification is directed to a video encoder, and the claimed invention is a method and computer readable medium for “quantizing digital video information”, the steps claimed only teach setting quantization parameters, not an actual analog-to-digital conversion of data, or a resultant step with quantized data.

Applicants respectfully submit that the claims are directed towards steps in quantization of video information which is patentable subject matter. However, for expediting the



prosecution, Applicants have amended claims 1, 5, 16, and 20 to recite an additional step of encoding video information. Applicants have also amended claim 14 to include the additional step of quantizing video information. Accordingly, Applicants respectfully request reconsideration and withdrawal of §101 rejections of claims 1-28 for being directed to non-statutory subject matter because of the lack of utility.

## VII. Claims 1-4

In the Office Action, the Examiner rejected claims 1-4 under §102(b) as being anticipated by Chiang. Claims 2-4 are directly or indirectly dependent on claim 1.

Claim 1 recites a method of quantizing digital video information. The method determines a buffer occupancy accumulator as a difference between an actual amount of bits used and a requested amount of bits. The method also limits an amount of change in the buffer occupancy accumulator based upon frame properties. The method also encodes the digital video information by using a quantizer value that is computed based on the buffer occupancy accumulator.

Applicants respectfully submit that Chiang does not anticipate claim 1 for at least the following reasons. *First*, Chiang does not disclose, teach, or even suggest a method of quantizing that determines a buffer occupancy accumulator as a difference between an actual amount of bits used and a requested amount of bits. Applicants respectfully submit that the Examiner has failed to identify wherein Chiang the limitation of determining a buffer occupancy accumulator as a difference between an actual amount of bits used and a requested amount of bits is disclosed. Specifically, in the Office Action, the Examiner has stated that Figure 1 of Chiang shows an encoder with rate control module that monitors and adjusts the bit rate of the data stream entering a buffer to prevent overflow and underflow. The Examiner also stated that the rate control module adjusts the quantizer scale based on the complexity of a frame and attempts to maintain an optimal bit rate that preserves image quality. *See*, page 7 of the Office Action.



Applicants respectfully submit that none of these alleged functionalities of Chiang cited in the Office Action, disclose a method of quantizing that determines a buffer occupancy accumulator as a difference between an actual amount of bits used and a requested amount of bits. “A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Accordingly, Applicants respectfully submit that the Examiner has failed to identify how the limitation of determining a buffer occupancy accumulator as a difference between an actual amount of bits used and a requested amount of bits is disclosed in Chiang.

*Second*, Chiang does not disclose, teach, or even suggest a method of quantizing that limits an amount of change in the buffer occupancy accumulator based upon frame properties. Applicants respectfully submit that none of the Figures and paragraphs cited by the Examiner discloses limiting an amount of change in a buffer occupancy accumulator based on frame properties. Accordingly, Applicants respectfully submit that the Examiner has failed to identify how Chiang discloses all limitations of claim 1.

In view of the foregoing remarks, Applicants respectfully submit that Chiang does not render claim 1 unpatentable. As claims 2-4 are dependent on claim 1, Applicants respectfully submit that claims 2-4 are patentable over Chiang for at least the reasons that were discussed above for claim 1. In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the rejections of claims 1-4.

#### **VIII. Claims 5-13**

In the Office Action, the Examiner rejected claims 5-10 under §102 (b) as being anticipated by Chiang. The Examiner also rejected claims 12-13 under §103(a) as being unpatentable over Chiang. The Examiner also rejected claim 11 under §103(a) as being



unpatentable over Chiang in view of Noh. Claims 6-13 is dependent on claim 5.

Claim 5 recites a method of quantizing digital video information. The method determines a base quantizer value. The method determines a quantizer adjustment based upon frame properties. The method encodes the digital video information based on a quantizer value that is  
5 computed as a sum of the base quantizer value and the quantizer adjustment.

Applicants respectfully submit that Chiang does not anticipate claim 5 for at least the following reasons. Chiang does not disclose, teach, or even suggest a method of quantizing digital video information that (1) determines a base quantizer value, (2) determines a quantizer adjustment based upon frame properties, and (3) computes a quantizer value as a sum of the base  
10 quantizer value and the quantizer adjustment.

In the Office Action, the Examiner cites figure 4 and column 13, line 32 to column 14, line 11 of Chiang for disclosing a rate control method that computes a quantizer scale for each macroblock in a frame based on a buffer fullness measure, which in turn is based on various frame properties. *See* page 7 and page 8 of the Office Action. Applicants respectfully submit that  
15 the quantizer scale disclosed by Chiang is neither a base quantizer value nor a quantizer adjustment. Specifically, Chiang discloses the quantizer scale as a step size used during quantization process. See column 2, lines 1-2 of Chiang. Furthermore, claim 5 recites a base quantizer value and a quantizer adjustment. The Examiner has not stated how these two values are anticipated by the quantizer scale disclosed in Chiang.

In view of the foregoing remarks, Applicants respectfully submit that Chiang does not  
20 render claim 5 unpatentable. As claims 6-13 dependent on claim 5, Applicants respectfully submit that claims 6-13 are patentable over Chiang for at least the reasons that were discussed above for claim 5. In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the rejections of claims 5-13.



## IX Claims 14-15

In the Office Action, the Examiner rejected claims 14-15 under §102 (b) as being anticipated by Chiang. Claim 15 is dependent on claim 14.

Claim 14 recites a method of determining a quantizer for quantizing digital video  
5 information. The method determines a delta value that includes a difference between a number of bits actually used and a number of bits that should have been used. The number of bits that should have been used is dependent on a frame type. The method quantizes the digital video information using a quantizer value computed based on the delta value.

Applicants respectfully submit that Chiang does not anticipate claim 14 for at least the  
10 following reasons. *First*, Chiang does not disclose, teach, or even suggest a method of determining a quantizer that determines a delta value that includes a difference between a number of bits actually used and a number of bits that should have been used. In the Office Action, the Examiner cites column 14, lines 12 to 46 of Chiang for rejecting claim 14. The Examiner states that Chiang discloses an encoding method that calculates the distortion for each  
15 encoded macroblock and checks if distortion is decreasing as the encoding progresses. If distortion is not decreasing, the target bit budget for the current frame type is adjusted according to a delta value.

Applicants respectfully submit that neither the cited lines nor any of the items listed by the Examiner disclose a method that determines a quantizer that determines a delta value that  
20 includes a difference between a number of bits actually used and a number of bits that should have been used. For instance, the delta value cited by the Examiner is a time difference and not a difference between a number of bits actually used and a number of bits that should have been used. Also, the cited paragraphs disclose a method of calculating distortion and not a method of determining a quantizer.



*Second*, Chiang does not disclose, teach, or even suggest a method of determining a quantizer in which a number of bits that should have been used is dependent on a frame type. In the Office Action, referring to Chiang, the Examiner states that since I frames, B frames, and P frames have different target bit budgets, the delta adjustment factor is different for intra  
5 macroblocks and inter macroblocks. Applicants respectfully submit that the cited paragraphs do not disclose a method of determining a quantizer in which a number of bits that should have been used is dependent on a frame type. If the Examiner believes otherwise, Applicants respectfully submit that the Examiner specifically identify the lines number where this limitation is disclosed in Chiang.

10 In view of the foregoing remarks, Applicants respectfully submit that Chiang does not render claim 14 unpatentable. As claim 15 is dependent on claim 14, Applicants respectfully submit that claim 15 is patentable over Chiang for at least the reasons that were discussed above for claim 14. In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the rejections of claims 14-15.

15 **X. Claims 16-19**

In the Office Action, the Examiner rejected claims 16-19 under §102 (b) as being anticipated by Chiang. Claims 17-19 is dependent on claim 16.

Claim 16 recites a computer readable medium that stores a computer program that is executable by at least one processor. The computer program includes sets of instructions for  
20 determining a buffer occupancy accumulator as a difference between an actual amount of bits used and a requested amount of bits. The computer program also includes sets of instructions for limiting an amount of change in the buffer occupancy accumulator based upon frame properties. The computer program also includes sets of instructions for encoding the digital video



information by using a quantizer value that is computed based on the buffer occupancy accumulator.

In the Office Action, the Examiner has stated that claim 16 is a software embodiment of the invention. Applicants assume that the Examiner has rejected claim 16 using the same grounds of rejection as claim 1. Accordingly, Applicants respectfully submit that claim 16 is patentable over Chiang for the same reasons as claim 1. Specifically, Applicants respectfully submit that Chiang does not anticipate claim 16 for at least the following reasons. *First*, Chiang does not disclose, teach, or even suggest a computer program for quantizing digital information that determines a buffer occupancy accumulator as a difference between an actual amount of bits used and a requested amount of bits. *Second*, Chiang does not disclose, teach, or even suggest a method of quantizing that limits an amount of change in the buffer occupancy accumulator based upon frame properties.

In view of the foregoing remarks, Applicants respectfully submit that Chiang does not render claim 16 unpatentable. As claims 17-19 are dependent on claim 16, Applicants respectfully submit that claims 17-19 are patentable over Chiang for at least the reasons that were discussed above for claim 16. In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the rejections of claims 16-19.

#### **XI. Claims 20-28**

In the Office Action, the Examiner rejected claims 20-25 under §102 (b) as being anticipated by Chiang. The Examiner also rejected claims 27-28 under §103(a) as being unpatentable over Chiang. The Examiner also rejected claim 26 under §103(a) as being unpatentable over Chiang in view of Noh. Claims 21-28 are dependent directly or indirectly on claim 20.

Claim 20 recites a computer readable medium that stores a computer program that is



executable by at least one processor. The computer program can implement a video encoder. The computer program includes sets of instructions for determining a base quantizer value. The computer program also includes sets of instructions for determining a quantizer adjustment based upon frame properties. The computer program also includes sets of instructions for encoding the digital video information based on a quantizer value computed as a sum of the base quantizer value and the quantizer adjustment.

In the Office Action, the Examiner has stated that claim 20 is a software embodiment of the invention. Applicants assume that the Examiner has rejected claim 20 using the same grounds of rejection as claim 5. Accordingly, Applicants respectfully submit that claim 20 is patentable over Chiang for the same reasons as claim 5. Specifically, Applicants respectfully submit that Chiang does not anticipate claim 20 for at least the following reasons. Chiang does not disclose, teach, or even suggest a computer program for quantizing digital video information that (1) determines a base quantizer value, (2) determines a quantizer adjustment based upon frame properties, and (3) computes a quantizer value as a sum of the base quantizer value and the quantizer adjustment.

In view of the foregoing remarks, Applicants respectfully submit that Chiang does not render claim 20 unpatentable. As claims 21-28 are dependent on claim 20, Applicants respectfully submit that claims 21-28 are patentable over Chiang for at least the reasons that were discussed above for claim 20. In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the rejections of claims 20-28.

## **XII. New claims**

In this amendment, Applicants have added claims 29-36. Applicants submit that these claims are fully supported by the specification and are allowable over the cited references.



## CONCLUSION

In view of the foregoing, it is submitted that all pending claims, namely claims 1-36 are in condition for allowance. Reconsideration of the rejections and objections is requested. Allowance is earnestly solicited at the earliest possible date.

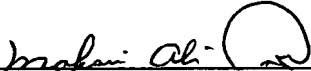
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Respectfully submitted,

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**Amendment to the Drawings**

The attached sheets of drawings include 3 new sheets for Figures 3 to 5 to show the features specified in the claims as required by the Examiner.

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Attachment: 3 New Drawing Sheets